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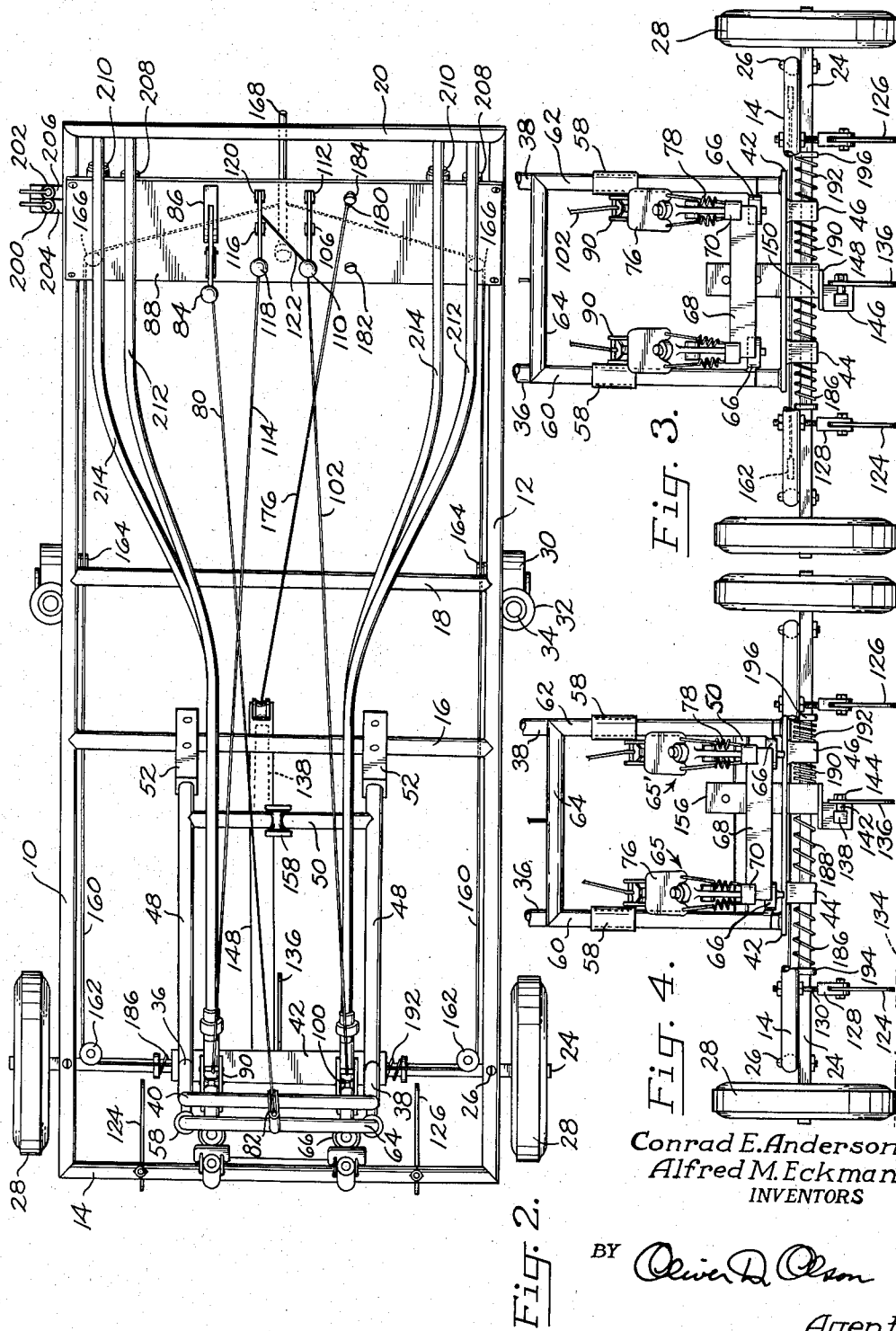
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PORTABLE STRIPE PAINTING APPARATUS

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2 Sheets-Sheet 2



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1

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PORTABLE STRIPE PAINTING APPARATUS

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This invention relates to stripe painting apparatus, and has for its primary objective the provision of portable apparatus by which to facilitate the application of traffic and pedestrian lines to roadways.

Conventional procedure for applying pedestrian cross-walk lines and other traffic indicating lines, involves the use of templates which serve to outline predetermined sections of lines. The template is laid down on the roadway and oriented by means of a chalk line, whereupon a painter applies paint to the roadway within the boundaries of the template. The template then is removed to the location of the next line section and the procedure repeated. A plurality of templates is required for lines of various configurations and widths.

Certain major disadvantages attend the conventional procedure outlined above. First, the requirement for a multiplicity of templates creates a problem of template manufacture, storage and transport. They are normally made of wood or metal and represents a substantial cost of initial manufacture and replacement. Their bulk presents a problem of storage and transport, as well as difficulty of manipulation.

The use of templates also requires the painter to assume a kneeling or stooping position during painting, with successive relocations of position along the length of the template. This is a time consuming procedure as well as an awkward and tiring position for the painter. In addition, the painter's face is hazardedly close to the paint fumes emanating from the paint spray, thus presenting a danger to his health.

Accordingly, it is a principal object of this invention to provide stripe painting apparatus which eliminates the necessity for templates and the disadvantages attending their use.

Another important object of this invention is the provision of stripe painting apparatus which is of portable construction for convenient manipulation in an upright posture.

Another important object of the present invention is the provision of stripe painting apparatus which affords ready adjustment of the width of a paint stripe.

A further important object of this invention is the provision of stripe painting apparatus in which means is provided for automatically centering a spray nozzle during adjustment of stripe width, to insure maximum uniformity of paint across the variable width of stripe.

A still further important object of the present invention is to provide stripe painting apparatus which is capable of connection to the conventional external source of supply of paint and compressed air, thus avoiding the necessity of having to transport the heavy and bulky supply with the apparatus.

The foregoing and other objects and advantages from this invention will appear from the following detailed description, taken in connection with the accompanying drawings, in which:

Fig. 1 is a view in side elevation of stripe painting apparatus embodying the features of this invention, the

2

front wheels of the apparatus being removed for better disclosure of structural details;

Fig. 2 is a plan view of the apparatus shown in Fig. 1;

Fig. 3 is a fragmentary view in front elevation as viewed from the left in Figs. 1 and 2 and showing one position of adjustment of the paint shields, a portion thereof being broken away to disclose details of construction; and

Fig. 4 is a fragmentary view in front elevation, similar to Fig. 3, and showing the paint shields in another position of adjustment for painting a stripe of different width.

In the embodiment illustrated, the components of the apparatus are supported upon a frame which includes the side members 10, 12 interconnected by the transverse front member 14, intermediate members 16, 18 and rear member 20. The side members are bent obliquely intermediate their ends, the rearward section thereof inclining upward from the transverse intermediate member 18 to the transverse rear member 20. These sections are reinforced by the angle braces 22.

A transverse shaft 24 is secured adjacent its outer ends to the frame side members, as by means of bolts 26, and the outer ends of the shaft serve to rotatably mount the forward wheels 28. Caster wheels 30 are mounted in carriers 32 supported in vertical bearings 34 secured to the frame side members adjacent the transverse member 18. The caster wheels thus are mounted for rotation on a vertical axis, to facilitate manipulation of the apparatus. In this regard, the transverse rear frame member 20 serves as a handle.

A secondary frame also is provided, and this frame includes the upright side members 36, 38 interconnected at their upper ends by the transverse top member 40 and at their lower ends by the transverse plate 42. Projecting downwardly from the plate are the spaced bearing blocks 44 and 46. These blocks are provided with axially aligned openings for slidable mounting on the transverse shaft 24. This shaft and the bearing block openings preferably are of square or other noncircular cross section.

The secondary frame also includes the inclined side brace members 48 which are secured at their forward ends to the upright side members. The brace members are interconnected adjacent their rearward lower ends by the transverse frame member 50. Secured to and extending rearwardly from each of the brace members is a bifurcated extension 52 which supports a pair of spaced rolls 54, 56. These rolls confine between them the transverse member 16 of the main frame.

Thus, the secondary frame is movable laterally with respect to the main frame, by sliding support on the transverse shaft 24 and transverse frame member 16.

Secured to the upright side members 36, 38 of the secondary frame, as by the welds illustrated, are the vertical guide sleeves 58. These sleeves receive slidably therein the vertical side members 60, 62 of an elevator frame. The upper ends of these side members are interconnected by the transverse top frame member 64.

Means is provided for detachably mounting a pair of spray gun heads 65, 65' on the elevator frame. In the embodiment illustrated, such means is provided to accommodate the mounting of conventional spray gun heads of the portable hand manipulated type. Adjacent the lower end of each side member 60, 62 there is secured, as by the welds illustrated, an inwardly extending socket 66. A transverse plate 68 extends between and interconnects these sockets, thus stabilizing the lower ends of the elevator frame side members. The transverse plate 68 supports a forwardly projecting receptacle 70 adjacent each end, each receptacle being substantially aligned, in a vertical longitudinal plane, with one of the sockets 66.

The nozzle portion 72 of the spray gun head is seated in the socket 66, with the orifice of the nozzle projecting

3

through an opening in the socket. The hanger hook 74 of the spray gun head is received within the receptacle 70, thus stabilizing the spray gun head against rotational displacement on the vertical axis of the nozzle. The spray gun head is secured releasably in this position by the U-shaped resilient clamp 76, the spring ends 78 of which are secured pivotally to opposite sides of the receptacle 70. The closed end of the clamp thus may be drawn over the spray gun head, whereupon the spring ends urge the head into firm seating position within the socket and receptacle.

Control means is provided for adjusting the elevator frame to predetermined vertical positions. In the embodiment illustrated, such control means is provided by the cable 80 which is attached at one end to the transverse top member 64 of the elevator frame. The cable is reeved over a pulley 82 mounted on the top member 40 of the secondary frame, and thence extends rearwardly for attachment to the control handle 84 which is mounted pivotally on a bracket 86 projecting from the control panel 88.

Control means also is provided for actuating each spray gun head 65, 65' and controlling the spray of paint therefrom. In the embodiment illustrated, such means is provided to accommodate use of the conventional spray gun heads illustrated. For each head there is provided a pair of pivoted links 90, 92 spaced apart laterally to receive the handle end 94 of the spray gun head between them. The lower ends of the links 92 support a transverse roller 96 which engages under the trigger 98 of the spray gun head, and the upper links 90 support between them a roller 100 which slidably engages the upper surface of the spray gun handle 94. It is to be understood that the trigger is spring loaded internally so as to be urged normally away from the handle, and this movement is accommodated by the pivoted links 90, 92.

A cable 102 or rod is connected at one end to the upper ends of the upper links 90 associated with spray gun 65'. The opposite end of the cable or rod is connected to the outer end of an arm 104, the inner end of which is mounted pivotally on a bracket 106 projecting from the control panel 88. Another length of cable 108 or rod interconnects the arm 104 and the control handle 110 which is mounted pivotally on a bracket 112 projecting from the control panel.

In similar manner, the other spray gun head 65 is connected through the rod or cable 114 (Fig. 2) to an arm mounted pivotally on the bracket 116 projecting from the control panel, an additional length of rod or cable interconnecting the arm and the control handle 118 mounted pivotally on bracket 120 projecting from the control panel.

In the preferred embodiment illustrated, means is provided for actuating both paint guns simultaneously from the control handle 118, for purposes explained more fully hereinafter. This is accomplished in the embodiment illustrated by interconnecting the control handle 118 and the arm 104 associated with the other control handle 110, by a length of flexible chain or cable 122. In this manner, clockwise rotation (Fig. 1) of the control handle 118 effects clockwise rotation of both arms, without causing rotation of the other control handle 110.

Means is provided for limiting the lateral spray of paint from the paint guns, in order that the painted stripe may have a desired predetermined width. Moreover, such means is provided to accommodate variations in stripe width over the range required for stripes of various designations.

Although the means provided for this purpose may take various forms, it is provided in the embodiment illustrated by a plurality of paint shield plates. Two of these plates 124 and 126 are mounted in fixed, laterally spaced position on the forward transverse member 14 of the main frame. This mounting is made by means of a clamp 128 to which each plate is secured, the clamp

4

having a threaded shank 130 receivable through a vertical hole in the front frame member. A pair of adjusting nuts 132 are mounted on the threaded shank to engage opposite sides of the forward frame member, to secure the plate in proper position of vertical adjustment. This adjustment preferably locates the bottom edge of the plate slightly above the road surface 134.

A third paint shield plate 136 is positioned between the laterally spaced fixed plates 124 and 126, and is mounted upon the forward end of a horizontal rod 138, as by means of a threaded bolt 140 extending laterally from the rod. A spacer sleeve 142 on the bolt is interposed between the rod and the plate and the latter secured by means of the nut 144. The spacer sleeve functions to offset the plate laterally to clear the forward downturned end 146 of the bracket 148 in which the rod is slidably mounted.

The forward end of the bracket 148 is secured to the bearing block 150 (Fig. 3) which is mounted slidably upon the non-circular transverse shaft 24, between the bearing blocks 44, 46 which support the secondary frame. The rearward end of the bracket carries an upstanding support 152 having a bifurcated section 154 in which a pair of vertically spaced rollers 156, 158 are mounted. These rollers receive between them the transverse frame 16 member of the secondary frame.

By virtue of the sliding mounting of the bracket 148 adjacent its forward and rearward ends, the bracket and associated rod 138 and intermediate paint shield plate 136 are movable laterally between the fixed paint shield plates.

Means is provided for adjusting the intermediate plate 136 laterally between the fixed plates. In the embodiment illustrated, this is provided by a pair of cables 160 each secured at its forward end to one side of the intermediate bearing block 150. Each cable extends laterally outward, through aligned openings in the bearing blocks 44, 46 supporting the secondary frame, thence around idler pulleys 162 mounted adjacent the outer ends of the transverse shaft 24, thence rearwardly under idler pulleys 164 mounted on the main frame adjacent the transverse frame member 18, thence along the inclined section of the main frame and around idler pulleys 166 mounted on the rear side of the control panel 88, and thence inwardly for connection at their rearward ends to a control lever 168 mounted pivotally on the rear side of the control panel. Thus, by movement of the control handle toward the lateral sides of the main frame, the cables are caused to draw the intermediate bearing block 150 laterally along the transverse shaft.

A coil spring 170 encircles the rod 138 between the downturned ends of the bracket, and bears at its rearward end against the rearward downturned end 146 of the bracket. The forward end of the spring bears against a washer 172 which is backed by a transverse pin 174 extending through the rod. Thus, the spring normally urges the rod to its limit of forward extension, with the plate 136 positioned in transverse alignment with the fixed plates 124, 126.

Means is provided for retracting the rod 138 and the attached plate 136 to a position rearwardly of the fixed plates 124 and 126, so as to expose the entire lateral dimension between the fixed plates to the spray from both paint guns. In the embodiment illustrated, such means is provided by a cable 176 attached at its forward end to the rearward end of the rod 138. The cable is reeved under a pulley 178 mounted on a rearward extension of the bracket 148, and the rearward end of the cable is provided with a loop 180 by which it may be anchored selectively on one of the studs 182, 184 projecting outwardly from the control panel 88. Thus, in the position illustrated, the loop end of the cable is mounted upon the upper stud 184, thus securing the intermediate plate 136 in retracted position. By removing the loop end of the cable from this stud, and

5

securing it on the lower stud 182, the intermediate plate is urged forwardly by the spring 170 to its position in transverse alignment with the fixed plates.

Means also is provided for automatically centering the spray nozzle of each spray gun between the pair of paint shield plates with which it is associated. Thus, means is provided for automatically centering the nozzle of spray gun 65 between the pair of plates 124 and 136, and the nozzle of spray gun 65' between the pair of plates 136 and 126 as the intermediate plate 136 is adjusted laterally to provide predetermined widths of striped lines. In the embodiment illustrated, such means is provided by the pairs of individual coil springs 186, 188 and 190, 192 which encircle the non-circular transverse shaft 24. The spring 186 of one pair abuts at one end against the bearing block 44 of the secondary frame and at its opposite end against a washer 194 fixed on the non-circular shaft 24, i.e., fixed in relation to the fixed paint shield plate 124. The other spring 188 of said pair abuts at one end against the bearing block 44 and at its opposite end against the bearing block 150 supporting the intermediate plate 136. In similar manner, the spring 192 of the other pair abuts at one end against the bearing block 46 of the secondary frame and at its opposite end against the washer 196 fixed on the non-circular transverse shaft. The other spring 190 of the last mentioned pair abuts at one end against the bearing block 46 at its opposite end against the bearing block 150 supporting the intermediate plate.

The springs of each pair are chosen to be substantially identical in length and strength. Thus, as the intermediate bearing block 150 is adjusted laterally along the transverse shaft 24, one pair of springs is compressed and the other pair of springs is expanded, equally, thus moving the secondary frame a proportionate distance to maintain the spray nozzles centered between the associated pairs of paint shield plates. This is exemplified in Figs. 3 and 4 of the drawings, wherein the intermediate plate 136 is moved toward the right two inches to change the spacing between the right hand pair of shield plates from six inches to four inches and the left hand pair of plates from six inches to eight inches. During this movement of two inches of the intermediate plate, the action of the pairs of springs functions to move the secondary frame one inch toward the right.

Means is provided for connecting the paint guns to a source of compressed air and paint. In this regard it is preferred that the source of compressed air and paint be located remote from the apparatus so that the latter may be manipulated with maximum ease and facility. In the embodiment illustrated, there is mounted on the rear side of the control panel a pair of conduit couplings 200 and 202, one for compressed air and one for paint. Each of these couplings is connected to a pipe 204 and 206 respectively, supported on the rear side of the control panel 88, and each pipe is provided with a pair of couplings 208 and 210 by which to connect the pairs of flexible conduits 212 and 214 to the paint guns, as will be understood.

The operation of the apparatus described hereinbefore is as follows: Assuming it is desired to paint a pedestrian lane stripe six inches in width, a chalk line is struck in the usual manner to provide a guide line. With the paint guns connected to the external source of compressed air and paint, the control lever 168 for the intermediate paint shield plate 136 is manipulated to adjust the intermediate plate to its position centrally between the fixed plates 124, 126. In this instance it is understood that the fixed plates are spaced apart a distance of twelve inches.

The apparatus is manipulated by hand to align one of the fixed plates, for example the plate 126, on the chalk line. With the elevator control lever 84 rotated counterclockwise (Fig. 1) to the position of desired elevation of the paint gun nozzles, the control lever 110 for paint gun 65' is pulled rearward and the apparatus simultaneously propelled forward. Paint is ejected from the paint

6

gun 65' between the spaced paint shield plates 126 and 136, and applied to the road surface 134. When the desired length of stripe has been painted, the paint gun control lever is released, whereupon it is rotated in the counterclockwise direction (Fig. 1) under the influence of the internal spring loading of the paint gun which causes separation of the trigger from the handle, as explained hereinbefore.

If it is desired to paint a stripe of twelve inch width, the elevator frame control lever 84 is rotated clockwise to elevate the spray guns to their desired level above the road surface. The retracting cable 176 is released from its normal position of engagement on the lower stud 182 and pulled upwardly and engaged on the upper stud 184, thus retracting the intermediate paint shield plate 136 to the position illustrated in Fig. 1. The bracket 148 is inclined rearwardly so as to elevate the bottom edge of the plate 136 above the surface to be painted, when the plate is retracted. With one of the fixed paint shield plates oriented on the chalk line, the control lever 118 is pulled rearward while simultaneously propelling the apparatus forward. Movement of this control lever, as explained hereinbefore, effects actuation of both paint guns, through the flexible linkage 122, thus spraying the desired quantity of paint within the lateral confines of the fixed plates.

It is to be noted that the arrangement of the spray guns at the forward end of the apparatus frame, permits the painting of stripes immediately adjacent curbs and other obstructions. When it is required to paint irregular designs, such as arrow heads, the paint gun is quickly releasable from the apparatus for hand manipulation in conjunction with templates.

Various changes may be made in the details of construction described hereinbefore without departing from the spirit of the invention and the scope of the appended claims.

Having now described our invention and the manner in which the same may be used, what we claim as new and desire to secure by Letters Patent is:

1. Stripe painting apparatus, comprising a frame, a pair of laterally spaced paint shield means mounted on the frame, one of the paint shield means being movable laterally to vary said spacing, paint spray nozzle means disposed between the pair of paint shield means, nozzle support means on the frame movable laterally with respect to the paint shield means, a pair of spring means of substantially equal length and strength, one end of each spring means engaging the nozzle support means, the opposite end of one of the spring means engaging the movable shield means and the opposite end of the other spring means being fixed relative to the fixed paint shield means, whereby the paint shield means and the nozzle support means have simultaneous lateral movement in such relation as to maintain the nozzle means substantially centered between the paint shield means as the spacing between the latter is varied.

2. The apparatus of claim 1 wherein the frame is provided with wheels for portability and the frame includes handle means for manipulation, and including paint shield adjusting means on the frame adjacent the handle means and engaging the movable paint shield means for adjusting the latter laterally, nozzle spray control means on the frame adjacent the handle means and engaging the nozzle means for actuating the latter, paint and compressed air coupling means on the frame for connection to external sources of supply, and conduit means interconnecting the coupling means and the nozzle means.

3. The apparatus of claim 2 including means releasably interconnecting the frame and nozzle means for detaching the latter for hand manipulation, the said conduit means being flexible to permit such hand manipulation.

4. Stripe painting apparatus, comprising a frame, a pair of laterally spaced paint shield means mounted on the frame, a third paint shield means mounted on the frame intermediate the pair of paint shield means, the third paint shield means being movable laterally to vary

its spacing from the pair of paint shield means, the third paint shield means also being retractable from its position between the pair of paint shield means, paint spray nozzle means disposed between the third paint shield means and each of the pair of paint shield means, nozzle support means on the frame movable laterally with respect to the paint shield means, and means interengaging the movable third paint shield means and the nozzle support means for simultaneous lateral movement thereof in such relation as to maintain the nozzle means substantially centered between their associated pairs of paint shield means as the spacing between the latter is varied.

5. The apparatus of claim 4 wherein the means interengaging the movable paint shield means and nozzle support means comprises a pair of spring means of substantially equal length and strength, one end of each spring means engaging the nozzle support means, the opposite end of one of the spring means engaging the movable shield means and the opposite end of the other spring means being fixed relative to the fixed paint shield means.

6. The apparatus of claim 4 including paint shield adjusting means on the frame and engaging the movable paint shield means for adjusting the latter laterally, paint shield retracting means on the frame and engaging the movable paint shield means for retracting the latter from between the pair of paint shield means, and a pair of nozzle spray control means on the frame and each engaging a nozzle means for actuating the latter.

7. The apparatus of claim 6 including means interconnecting the pair of nozzle spray control means for actuating one of the nozzle means by its associated control means and actuating both nozzle means by the control means.

8. The apparatus of claim 4 including nozzle elevating means on the frame and engaging the nozzle means for adjusting the latter vertically.

9. The apparatus of claim 4 wherein each paint shield

means comprises a vertically disposed plate arranged to terminate at its lower edge adjacent a surface to be painted.

10. The apparatus of claim 4 wherein the frame is provided with wheel for portability and the frame includes handle means for manipulation.

11. The apparatus of claim 10 including paint shield adjusting means on the frame adjacent the handle means for engaging the movable paint shield means for adjusting the latter laterally, paint shield retracting means on the frame adjacent the handle means and engaging the movable paint shield means for retracting the latter from between the pair of paint shield means, a pair of nozzle spray control means on the frame adjacent the handle means and each engaging a nozzle means for actuating the latter, paint and compressed air coupling means on the frame for connection to external sources of supply, and conduit means interconnecting the coupling means and each nozzle means.

12. The apparatus of claim 11 including means releasably interconnecting the frame and nozzle means for detaching the latter for hand manipulation, the said conduit means being flexible to permit such hand manipulation.

13. The apparatus of claim 4 including means mounting the third paint shield means for elevating the latter vertically as it is retracted.

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